

WHAT IS CLAIMED IS:

- 1 1. A method for nanopatterning of a substrate, comprising:
 - 2 a) supplying a multilayer article comprising at least one
3 deformable substrate, at least one brittle layer, and at least one coating layer
4 adjacent said brittle layer, said coating layer having different physicochemical
5 properties than said brittle layer;
 - 6 b) exerting a strain on said multilayer article such that cracks
7 develop in said brittle layer exposing surfaces in said cracks having no coating layer
8 thereon.
- 1 2. The method of claim 1, wherein said step of exerting a strain
2 comprises unidirectionally stretching said multilayer article.
- 1 3. The method of claim 1, wherein said step of exerting a strain
2 comprises bending said multilayer article.
- 1 4. The method of claim 1, wherein said step of exerting a strain
2 comprises stretching said multilayer article bending said multilayer artical.
- 1 5. The method of claim 1, wherein said deformable substrate
2 comprises a polyorganosiloxane elastomer and said brittle layer comprises a
3 silaceous layer.
- 1 6. The method of claim 5, wherein said coating layer comprises
2 a hydrophobic coating.
- 1 7. The method of claim 5, wherein said coating layer comprises
2 a first, hydrophobic coating, and a second coating on said first coating, said second
3 coating comprising a substance which prevents attachment of biological organisms.
- 1 8. The method of claim 7, further comprising coating said
2 exposed surfaces with a bioactive coating.

1 9. The method of claim 5, wherein said silaceous layer is formed
2 by oxidizing a surface of said polyorganosiloxane deformable substrate.

1 10. The method of claim 1, wherein said step of exerting a strain
2 comprises stretching said multilayer article in at least two directions, either
3 simultaneously or sequentially.

1 11. A nanopatterned device comprising:
2 a) a deformable substrate;
3 b) a brittle layer on at least one side of said deformable substrate,
4 and having a first set of physicochemical properties;
5 c) a coating layer on a side of said brittle layer remote from said
6 deformable substrate, said coating layer having a second set of physicochemical
7 properties different from said first set of physicochemical properties; and
8 d) cracks through said coating layer and into said brittle layer,
9 surfaces of said cracks exhibiting physicochemical properties different from said
10 second set of physicochemical properties.

1 12. The nanopatterned device of claim 11, wherein said cracks
2 extend partly through said brittle layer.

1 13. The nanopatterned device of claim 11, wherein said cracks
2 extend through said brittle layer and expose surface of said deformable substrate.

1 14. The nanopatterned device of claim 11, wherein said
2 deformable substrate comprises a thermoplastic and/or an elastomer.

1 15. The nanopatterned device of claim 11, wherein said
2 deformable substrate comprises an organopolysiloxane elastomer, and said brittle
3 layer comprises a silaceous coating formed from a surface portion of said elastomer
4 or deposited on said elastomer.

1 16. The nanopatterned device of claim 15, wherein said brittle
2 layer comprises oxidized organopolysiloxane.

1 17. The nanopatterned device of claim 11, wherein said coating
2 layer comprises a hydrophobic layer.

1 18. The nanopatterned device of claim 15, wherein said coating
2 layer comprises a hydrophobic layer, and wherein said hydrophobic layer is formed
3 by hydrophobicizing said silaceous coating with a silane.

1 19. The nanopatterned device of claim 17, wherein said coating
2 layer comprises a hydrophobic coating layer and a bioactive layer on said
3 hydrophobic layer.

1 20. The nanopatterned device of claim 19, wherein said bioactive
2 layer comprises a layer which inhibits attachment of biological organisms.

1 21. The nanopatterned device of claim 20, wherein said cracks are
2 coated with a bioactive coating which encourages attachment of biological
3 organisms.

1 22. The nanopatterned device of claim 11, comprising a plurality
2 of parallel cracks.

1 23. The nanopatterned device of claim 11, comprising a plurality
2 of parallel cracks and a plurality of cracks at an angle to said plurality of parallel
3 cracks.

1 24. A method of growing cellular organisms comprising plating
2 of at least one cellular organism on cracks in the device of claim 11, and culturing
3 said cellular organism.